

Rounding Decimals

Reporting Category Number and Number Sense

Topic Rounding decimals

Materials

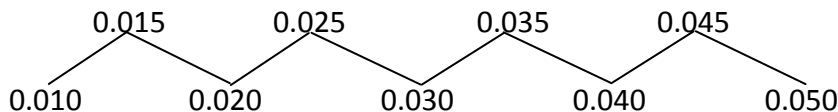
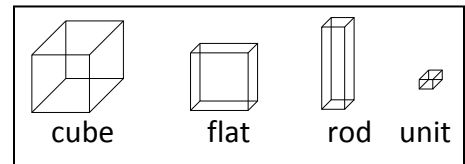
- Base-10 blocks (large cube, flats, rods, units)
- Decimal Number Line
- Decimal Grids (attached)
- Decimal cards (See the “Reading and Writing Decimals” activity.)

Vocabulary

decimal, round, estimate, tenth, hundredth, thousandth, whole, place value, value, digit, leading zero, decimal point

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Have students begin by creating base-10 models or decimal grids of some decimal numbers. In order to do this, you must first identify the “whole” for students. For example, if you identify the flat as 1, then the rod is 0.1, and the unit is 0.01. Have students use the models or grids to tell what whole number, what tenth, or what hundredth each decimal number is closest to. (You may need to review place value and writing decimals.) Have students write out the decimals they created and again tell what whole number, what tenth, or what hundredth each of their decimals is closest to. Have them use the models or grids to help them create and restate the foundations of rounding. If you wish, use decimal cards to have students randomly choose decimals to round to a given place.
2. If students are struggling to determine which two numbers a decimal is between, provide them with a decimal number line on which to determine proximity. Also, a graphic of a “rounding mountain” (see below) may help some students more readily grasp rounding.



Students locate the desired number on the mountain range. If it lies on a slope, it falls down to the nearest number. If it lies exactly on the top of a peak, it rolls over to the right side and falls down.

Assessment

- **Questions**

- If a certain decimal number rounds to the following nearest whole number, tenth, and hundredth: _____, _____, _____ (*give the three numbers*), what could be the original decimal number before it was rounded? How do you know?

- **Other**

- Give students decimal numbers, and use a spinner with a decimal place in each space to determine which place students are to round to. Have them record their responses on a recording sheet.
- Put students in groups of three, and provide each group with an envelope of three numbers that have already been rounded—one number to the nearest whole, one to the nearest tenth, and one to the nearest hundredth. Post the original decimal as well as some other similar numbers on index cards for all groups to see. Have each group determine what their original decimal number is. For example, a group receives the numbers 4, 3.6, and 3.64; the group picks 3.639 as the original decimal number that was rounded to 4, 3.6, and 3.64.
- Give students clues about mystery decimal numbers, and have them guess the numbers and justify their answers by explaining how they know they are correct.
- Have students draw a picture to represent how to round a given decimal number.
- Have students match decimal numbers to numbers that have been rounded to specified places.

Extensions and Connections (for all students)

Estimating Sums and Differences of Decimals

- Present the following scenario to the class. “You are in the grocery store and need to buy bread, lunchmeat, and chips to make your lunch. You only have a ten-dollar bill, so you are worried that you won’t have enough money. The bread is \$1.82, the lunchmeat is \$4.93, and the chips are \$2.03. Can you tell without writing anything down whether you will have enough money to buy all three items?” After students have some time to think about the answer, have them vote yes or no. Talk about the strategies they used to *estimate* the total.
- Discuss as a class other examples in which you would need to estimate decimal numbers instead of finding the exact answer (e.g., calculating distances ran or driven, calculating cooking ingredients). Discuss the concept that rounding each decimal to the nearest whole number and then adding or subtracting gives a valid whole-number estimate. Also talk about using benchmarks when estimating (e.g., determining whether the number is closer to 0 or 1).
- Provide students with practice problems involving estimating sums and differences of decimals. Make sure to include decimals to tenths, hundredths, and thousandths (e.g., $3.9 + 2.446$) to emphasize rounding to the closest whole number. Display a problem for about five seconds, and then remove it. Have students estimate the answer mentally and write it down. Ask selected students for their estimates, and have them explain how they made it.
- If time permits, have students write and exchange their own story problems involving estimating sums and differences of decimals.


Strategies for Differentiation

- Provide students with a visual strategy or model of how to round to the nearest whole number.
- Have students highlight or circle the number in the tenths or hundredths place to assist with rounding.
- Provide students with a cardboard frame to frame the targeted place value.
- Have students use a paint software program to create visual representations of decimals on the tenths, hundredths, and thousandths grids.
- Have students use individual place-value mats to assist with rounding activities. (Each place is coded with a different color and the students use number cards.)
- Have students work in small groups, using their individual place-value mats to solve assigned problems.
- Have students use a math jingle or rap to remember how to round to the nearest whole number, tenth, or hundredth.
- Have students act out one of the visual strategies to remember how to round to the nearest whole number (e.g., rounding mountain strategy).
- Have student pairs create a model of the mountain strategy.
- Have students use decimal cards with numbers written with puffy paint, sand, glitter, etc., in different colors to highlight the targeted place values when practicing rounding.
- Have students turn their notebook paper sideways to create vertical lines for writing decimal numbers.
- Have each student create on his/her desk a visual cue for rounding whole numbers.
- Provide students with a list of steps to follow when rounding to the nearest whole number, tenth, and hundredth.
- Have students use a wall chart and/or individual mat to order the base-10 blocks.
- Have students use colored stickers, puffy paint, sequins, etc., to represent decimals on paper.
- Have students use tennis balls cut in half to represent decimals in numbers.
- Have students use colored coded vertical lines to represent the places in numbers with decimals to assist with number placement.
- Invite the school librarian to discuss the Dewey Decimal System.

Decimal Grids

Name _____ Date _____

FLAT



RODS

[illegible]

UNITS

[illegible]

UNITS

[illegible]